

CLAIMS

What is claimed is:

- 1 1. A method for improving performance of a program, comprising:
2 providing a call to a clone of a function from which the clone is created;
3 the function representing programming code performing a task for
4 the program;
5 generating information mapping the clone to the function;
6 at link time for the program, if no function body of the clone is accessible
7 by a linker, then the linker using the information mapping the clone
8 to the function to satisfy a linker's requirement; and
9 at load time for the program, if no function body of the clone is accessible
10 by a loader, then the loader, based on the information mapping the
11 clone to the function, allowing selection of a body of the function;
12 and if the body of the clone is accessible by the loader, then the
13 loader allowing selection of the body of the clone.
- 1 2. The method of claim 1 wherein a call to the function is substituted by the call to
2 the clone of the function.
- 1 3. The method of claim 2 wherein a compiler substitutes the call to the function by
2 the call to the clone of the function.
- 1 4. The method of claim 1 wherein the mapping information is included in an
2 annotation section of the object of the program.

- 1 5. The method of claim 1 wherein a compiler generates the mapping information.
- 1 6. The method of claim 1 wherein the mapping information is stored in the loadable
2 note section for use by the loader.
- 1 7. The method of claim 1 wherein the body of the clone for use by the call to that
2 clone is selected from a list of bodies based on a priority.
- 1 8. The method of claim 1 wherein the function has more than one clone in the
2 program.
- 1 9. The method of claim 1 wherein the clone is associated with a flag identifying the
2 clone as a function clone.
- 1 10. The method of claim 1 wherein symbol resolution of the clone is delayed to the
2 load time for the program based on a linkage entry provided by the linker.
- 1 11. The method of claim 1 wherein a name representing the clone includes one or a
2 combination of a condition for cloning and a name representing the function.
- 1 12. The method of claim 1 wherein the body of the clone is included in a library for
2 use by the program.
- 1 13. The method of claim 1 wherein a compiler creates the body of the clone based on a
2 programming statement provided to the compiler.

1 14. The method of claim 1 wherein the compiler creates the body of the clone after an
2 analysis determining advantages and disadvantages of such creation.

1 15. The method of claim 1 wherein the clone is created based on one or a combination
2 of:

3 a logical relationship between at least two parameters passed to the
4 function;

5 an alias-relationship between at least two parameters passed to the
6 function;

7 a value of at least one parameter passed to the function from; and

8 a number of alignment bytes of at least one parameter passed to the
9 function.

1 16. The method of claim 1 wherein the clone is created based on profile data of the
2 function.

1 17. A method for using a clone cloned from a function in a program, comprising:
2 using information mapping the clone to the function to satisfy a linker's
3 requirement of having a clone body for a call to the clone; the
4 linker's requirement being part of building the program; and
5 building a library that includes the body of the clone;
6 wherein the function represents programming code performing a task for
7 the program and building the program and the library are
8 independent of one another.

- 1 18. The method of claim 17, prior to building the library that includes the body of the
2 clone, comprising building the library that does not include the body of the clone.
- 1 19. The method of claim 17 wherein the call to the clone has replaced a call to the
2 function.
- 1 20. The method of claim 17 wherein the clone is created based on information passed
2 to the function.
- 1 21. A method for using a clone cloned from a section of code of a program,
2 comprising:
3 substituting a call to the section of the code by a call to the clone;
4 at link time for the program, mapping the clone to the section of code;
5 at load time for the program, mapping the clone to the section of code; and
6 during execution of the program, if a body of the clone is available in a
7 library used by the program, then using that body, else if the body
8 of the clone is not available in the library, then using the section of
9 code from which the clone is cloned.
- 1 22. The method of claim 21 being implemented as program instructions stored in a
2 computer-readable medium.

1 23. A system for using a clone cloned from a function in a program, comprising:
2 means for mapping the clone to the function to satisfy a linking
3 requirement of having a clone body for a call to the clone; the
4 linking requirement being part of building the program; and
5 means for building a library that includes the body of the clone;
6 wherein the function represents programming code performing a task for
7 the program, and building the program and the library are
8 independent of one another.

1 24. The system of claim 23 wherein the clone is created based on information passed
2 to the function.

1 25. A computer-readable medium embodying instructions for performing a method for
2 improving performance of a program, the method comprising:
3 providing a call to a clone of a function from which the clone is created;
4 the function representing programming code performing a task for
5 the program;
6 generating information mapping the clone to the function; and
7 creating the clone based on one or a combination of
8 a logical relationship between at least two parameters passed to the
9 function;
10 an alias-relationship between at least two parameters passed to the
11 function;
12 a value of at least one parameter passed to the function from; and

13 a number of alignment bytes of at least one parameter passed to the
14 function.

1 26. The computer-readable medium of claim 25 wherein:

2 at link time for the program, if no function body of the clone is accessible
3 by a linker, then the linker using the information mapping the clone
4 to the function to satisfy a linker's requirement; and
5 at load time for the program, if no function body of the clone is accessible
6 by a loader, then the loader, based on the information mapping the
7 clone to the function, allowing selection of a body of the function;
8 and if the body of the clone is accessible by the loader, then the
9 loader allowing selection of the body of the clone.

1 27. The computer-readable medium of claim 25 wherein the program includes
2 multiple calls to multiple clones.